15 cases little or no benefit resulted. In most instances various forms of treatment had been used with no benefit. Out of 16 cases of purely functional neurosis, one injection was curative in 9; no improvement followed in 2 cases. Success followed one injection in 3 cases of retroflexion which operation had failed to influence. The sacral pain was completely relieved in 11 out of 13 cases of chronic inflammatory disease of the adnexa and parametria. Two out of 3 cases of enuresis were cured by one injection. From his observations he concludes that epidural injections of normal salt solution are indicated in those cases of sacral pain where the absence of a demonstrable pelvic lesion makes local or operative treatment useless and where the other usual methods have failed. Further, he recommends the injection for the treatment of functional bladder conditions as well as essential pruritis vulvæ and coccygodinia.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

WARFIELD T. LONGCOPE, M.D.,

DIRECTOR OF THE AYER CLINICAL LABORATORY, PENNSYLVANIA HOSPITAL, PHILADELPHIA.

The Relative Importance of the Bovine and Human Types of Tubercle Bacilli in the Different Forms of Human Tuberculosis.—Park and Krumwiede (*Jour. Med. Research*, 1910, xxiii, 205) report the results of an extensive statistical study of 43 strains of tubercle bacilli obtained from unselected cases of tuberculosis in human beings. Most of the material was derived from the New York hospitals. They conclude that tubercle bacilli isolated from man fall into two groups; one of these groups is identical in all its characters with that found in cattle, and consequently they differentiate two groups which have been designated human and bovine types. Each type shows certain differences, the most important for separation being found culturally and in virulence. The great majority of cultures group themselves around two extremes, though there are a few cultures showing variant characteristics. There is no overlapping of the characteristics; these two types are probably different because of residence in different hosts over long periods of time, and as such are stable. Though observations have been recorded to show that a rapid change of type may take place, these experiments are incomplete and inconclusive, and no confirmation of such results could be obtained by the authors. The result of this study showed that of the 436 cultures examined, 403, or something over 90 per cent., were of the human type. Only one culture of bovine type was found in an adult, and that in a case of genito-urinary tuberculosis; 9 cultures of the bovine type out of a total of 54 occurred in children from five to sixteen years of age, and 22 cultures out of a total of 84 occurred in children under five years of age. It may thus be seen that the bovine type of tubercle bacillus occurs most frequently early in life, over 26 per cent. of the cases of tuberculosis in children under five years of age showing this type of bacillus. The bovine type of bacillus was found most frequently in cervical tuberculous adenitis, though it was also found in abdominal tuberculosis, in generalized tuberculosis of alimentary origin, in generalized tuberculosis, and tuberculous meningitis. These valuable statistics, the largest that have been accumulated by any one writer, added to the collected statistics, give a total of 1042 cases of tuberculosis in which the type of organism has been identified.

The Presence of a Diastatic Ferment in Leukocytes.—It was first shown by Bial in 1892 that the blood and lymph contained a ferment which was capable of digesting starch. Later, this was fully confirmed by others, but there has been much discussion concerning the origin of this enzyme. The theory that it came from the pancreas or from the liver, which was also shown to possess diastatic properties, seemed most probable. HABERLANDT (*Pflüger's Arch.*, 1911, cxxxii, 175) has recently published some investigations which throw very definite light upon, at least, one possible source of the diastatic ferment of the blood. Working at first with cold-blooded animals, he was able to show that the lymph from the lymph sacs of frogs was capable of digesting starch. Different starches, however, showed various grades of susceptibility to this ferment. Amylen, a starch from wheat was most easily affected, whereas the starches from potato and rice were much less readily acted upon. Microscopically the lymph contained a few leukocytes and by studying these cells it was possible to make out that they ingested the starch granules. Later the starch granules underwent dissolution within the protoplasm of the cell. By increasing the number of leukocytes in the lymph the amount of digested material increased. There was, however, always some digestion of the starch granules, even though the lymph was free of cells. The ferment action was therefore not wholly dependent upon the presence of leukocytes. The same ferment was demonstrated in the subcutaneous tissues and tissue juices of rabbits, and here again the action was increased by the presence of leukocytes. It was thought possible that the ferment which was present in the serum, and tissue juices might rise from destruction of cells, and therefore the relative amount of enzyme was estimated in blood plasma in fresh serum and in blood serum which had stood for twenty-four hours in contact with the clot. The proportion of ferment, however, was equal in each instance, and therefore it did not seem probable that the enzymes were liberated to any amount from the leukocytes during the production of the blood clot.

The Action of Diuretics upon Diseased Kidneys.—In a previous article (*Deut. Arch. f. klin. Med.*, 1909, xcviii) HEDINGER and TAKAYASU have shown by means of experimentally induced nephritis that the kidney reacts differently toward certain diuretics, according to the toxic agent which is used to induce the nephritis. Chrome salts, sublimate, and uranium nitrate are toxic agents which attack first the tubular epithelium and leave at first the vessels undamaged. In the early stages of this tubular form of nephritis salt solution and caffeine, when ingested, cause an increase in the volume of the kidney with diuresis. Cantharadin and arsenic, on the other hand, attack primarily the bloodvessels of the kidney and set up a vascular form of nephritis.